Remarks

Thorough examination by the Examiner is noted and appreciated.

The claims have been amended to place the claims in condition for allowance or in better form for appeal. Support for the amended and newly drafted claims are found in the original claims and/or Specification.

Claim Rejections under 35 USC 102(e)

Claims 1-2, 4-16, and 18-20 stand rejected under 35 USC 102(e) as being anticipated by Lee et al. (US Pat No. 6,172,399). Lee et al. disclose a microwave method for annealing ion implanted wafers to achieve a desired doping profile (see Abstract). In an experimental section Lee et al. disclose using a preamorphized silicon wafer (**without regularly repeating semiconductor structures**) bombarded with high energy Germanium ions and doped with boron followed by microwave heating (see e.g. col 6, lines 15-20). Lee et al. determine dopant profile through a thickness portion of the wafer (**without regularly repeating semiconductor structures**) by a conventional SIMS method prior to, and after microwave annealing (see col 7, lines 3-7) to determine the effect of microwave heating on dopant diffusion in a wafer (**without regularly repeating semiconductor structures**). Lee et

al. disclose a series of SIMS plots for different regions of the wafer **(without regularly repeating semiconductor structures)** subjected to microwave exposure (See Fig 8, col 7, lines 33-41).

Nowhere do Lee et al. disclose determining "a 2-dimensional doping concentration comprising the doping profile for an individual semiconductor structure comprising the plurality" as disclosed and claimed by Applicants. For example, Applicants define the term 'regularly repeating' in paragraph 0037 of the Specification as "a shape with at least two dimensions that repeats itself in at least one direction along a length interval".

Applicants respectfully suggest that Examiner misreads the disclosure of Lee et al. Lee et al. does not teach regularly repeating semiconductor structures each comprising a doping profile present in the microwave heated wafer and nowhere suggests that a 2-dimensional doping concentration of a doping profile for an individual semiconductor comprising the regularly repeating semiconductor structures can be determined.

Furthermore, contrary to Examiners assertion, Lee et al. nowhere discloses a planarization step of "planarizing the monitor device through a thickness of the regularly repeating

semiconductor structures to reveal a target surface overlying the doping profile". Examiner refers to col 7, lines 9-32 where Lee et al. discuss using "a gaussian microwave beam" as opposed to "a flat-top profile" microwave beam. Applicants respectfully suggest Examiner is simply wrong in claiming that Applicants planarization step is taught or disclosed in Lee et al.

Lee et al.'s disclosure of individual semiconductor structures and doping profiles (see e.g., Figure 1A through 1C and Background of the invention e.g., columns 1 and 2) is limited to a general discussion of the importance of doping profiles in general for CMOS devices and the problem of diffusion of dopants by conventional annealing methods as opposed to microwave heating which the method of Lee et al. solves. Lee et al. nowhere disclose making a SIMS measurement to determine the doping profiles of individual **regularly repeating** semiconductor structures but rather disclose a doped experimental **semiconductor wafer (without regularly repeating semiconductor structures)** subjected to a SIMS measurement in an experimental method to demonstrate the effect of microwave heating on dopant diffusion in a uniformly doped wafer **(without regularly repeating semiconductor structures)** (see col 6, lines 15-20). Lee et al. is clearly insufficient to anticipate Applicants disclosed and claimed invention.

Examiners response to Applicants previous arguments refers to col 7, lines 33-42 to support his assertion that Lee et al. "disclose determining a 2-dimension doping profile of a semiconductor device". Lee et al. disclose a SIMS profile taken from a region of the wafer exposed to microwave heating **(without regularly repeating semiconductor structures)** to demonstrate the lack of dopant diffusion in a microwave annealing process. Moreover, Applicants do not claim what Examiner asserts Lee et al. discloses. Examiner is apparently construing the entire wafer of Lee et al. **(without regularly repeating semiconductor structures)** as a "semiconductor device" which is not Applicants claimed or disclosed invention.

Nowhere do Lee et al. suggest, teach, or hint that a 2-dimensional profile of an individual semiconductor structure comprising a plurality of regularly repeating semiconductor structures can be accomplished by a SIMS measurement.

Claim Rejections under 35 USC 103(a)

Claims 3 and 17 stand rejected under 35 USC 103(a) as being unpatentable over Lee et al. (US Pat No. 6,172,399) as applied above. Applicants reiterate the comments made above with respect to Lee et al.

With respect to claim 3, Examiner argues that "the process of planarizing a layer using a chemical mechanical polishing (CMP) is well known to a person having ordinary skill in the art." Applicants respectfully point out that whether an individual step in Applicants invention is well known in the art is irrelevant to the issue of patentability.

"The fact that references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references." *Ex parte Levengood, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).*

In any event, as previously explained Lee et al. does not disclose Applicants invention nor is there any suggestion or teaching of a planarization process in Lee et al. or a regularly repeating pattern of semiconductor structures or the step of determining a doping profile for an individual semiconductor structure of the regularly repeating pattern of semiconductor structures.

With respect to claim 17, Examiner argues that "there is no evidence indicating the length of the rectangular shape is critical and it has been held that it is not inventive to

discover the optimum or workable range of a result-effect variable with given prior art conditions by routine experimentation".

The above argument, by its own terms, and as is well recognized by the case law including *In re Woodruff 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936, (Fed Cir 1990)*, presupposes that the general conditions (or elements) of Applicants claimed invention is present in the prior art and that patentability depends on the ranges of the result effective variable.

Applicants respectfully assert that Lee et al. falls far short of anticipating Applicants claimed invention with respect to both claims 1 and 12 and therefore is of no help to Examiner in establishing a *prima facie* case of obviousness.

"First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. **Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success

must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)*) Emphasis added.

The Claims have been amended to place Applicants claims in condition for allowance or in better form for appeal. A favorable consideration of Applicants' claims is respectfully requested.

In the event that the present invention as claimed is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

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